State of Ohio Environmental Protection Agency, Box 1049, 361 East Broad Street, Columbus, 43216 (614) 466-8565

FILE COPY

FOA0338

James A. Rhodes
Governor
Ned E. Williams, P.E.
Director

January 3, 1977

Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

Re: Hobart Brothers Company
Miami County
Industrial Wastewater

Mr. R. W. Phillips, Manager
Facilities Engineering
Hobart Brothers Company
600 West Main Street
Troy, Ohio 45373

Dear Mr. Phillips:

Thank you for meeting with me on December 28, 1976, at your Troy facilities. Also in attendance at various times during our discussions were the following individuals: Kenneth H. Driver, Manager of Manufacturing Engineering (Hobart); John W. Penrod, Assistant Manager Facility Engineering (Hobart); Robert Lamb, Maintenance Foreman (Hobart); Kenneth Bashore, Maintenance (Hobart); Stephen Severyn, Municipal Wastewater Engineer (Ohio EPA); Kenneth Harsh, Aquatic Biologist (Ohio EPA).

The purpose of our visit was to determine the extent to which Hobart was involved in a recent spillage of large quantities of ammonia to the City of Troy wastewater sewerage system. These findings, conclusions, and recommendations are submitted for your consideration and action:

FINDINGS:

1. Our records show that Hobart Brothers Company operates a pre-treatment system for their industrial wastewater prior to discharge to the City of Troy sanitary system. Incorporated within this pre-treatment system are facilities for neutralization of the periodic batch discharges of high strength acid wastewaters. Anhydrous ammonia is utilized in the neutralization of these acidic wastewaters.

2. Mr. Penrod indicated that around noon time on Thursday, December 23, 1976, a 750 gallon hydrochloric acid tank at the "cleaning line" was drained to the pre-treatment system. Mr. Penrod believes that when these acid wastewaters reached the pre-treatment system, the ammonia feeding

equipment turned on but unfortunately did not shut off after neutralizing the batch discharge. It appears that a high rate of ammonia feeding continued throughout the remainder of Thursday, December 23, 1976, and on into Friday, December 24, 1976. The ammonia feeding equipment was apparently shut off around 9:30 a.m. on Friday, December 24, 1976.

3. Mr. Penrod checked with Hobart's anhydrous ammonia supplier and learned that they (Hobart) had received a delivery of anhydrous ammonia on December 23, 1976. This ammonia delivery apparently filled the ammonia (10,000 gallons) storage tank to 72% of its capacity. After discovery and cessation of the ammonia spillage, this 10,00 gallon storage tank contained only approximately 44% of its capacity. Accordingly, it is estimated that approximately 2,800 gallons of anhydrous ammonia was spilled into the Troy wastewater sewage system in less than a 24-hour period. A portion of this total volume was utilized in the neutralization of the 750 gallon batch discharge of hydrochloric acid.

4. Mr. Penrod indicated that the neutralization facilities had been designed to be a "fail safe system". The ammonia feeding apparatus utilizes two independent pH monitor/controllers. The first pH probe senses the need for starting or stopping the ammonia feeding apparatus. The second pH probe also can sense the need to shut off the ammonia feeding equipment. However, after this ammonia spillage, it was learned that the conduit holding the first pH probe had broken and allowed the pH probe to fall into the wastewater stream and be damaged. The second pH probe apparently malfunctioned and was unable to shut off the ammonia feeding equipment at the appropriate time.

5. Discussions with Mr. Penrod and a Honeywell service man revealed that the pH control system was involved in a quarterly calibration program and that the last calibration of this system was apparently on October 28, 1976.

6. An inspection of the settling basin following the neutralization facilities revealed that these basins were completely filled with settled sludges and were no longer performing their designed function. These settling basins were reportedly last cleaned sometime during the summer of 1976. The metallic sludges removed from the basins were buried on nearby Hobart property.

CONCLUSIONS:

1. It appears that on Thursday, December 23, 1976, and Friday, December

24, 1976, Hobart Brothers Company spilled anhydrous ammonia to the City of Troy wastewater sewerage system at a rate that theoretically would be expected to yield influent concentrations of ammonia exceeding 600 mg/l.

2. Hobart personnel expressed concern over this ammonia spillage and interest in taking steps to decrease the likelihood of this situation recurring.

RECOMMENDATIONS:

1. Calibration of the pH monitoring and control system at the wastewater pre-treatment facility should be done on at least a monthly basis. Less formal checks of this system's performance should be performed on a daily or weekly basis.

2. One of the pH meters (probably the back-up pH meter) should be converted to a recording pH meter such that a record of a day's or a week's pH values can be reviewed.

3. The sludge settling tanks following the neutralization system should be cleaned at least quarterly. In all likelihood, sludge depth should not be allowed to accumulate to greater than half the depth of the respective settling basins. Hobart Brothers Company should contract with experienced wastewater control consultants for a review of their pre-treatment facilities. These consultants should compare the Hobart pre-treated wastewaters with the proposed Federal USEPA pre-treatment guidelines and with any and all City of Troy industrial wastewater pre-treatment requirements. Subsequent to these reviews, Hobart Brothers Company should submit to the Ohio EPA plans for upgrading their pre-treatment system in line with the consultant's recommendations.

4. Hobart Brothers Company should submit a letter to this office by January 21, 1977, indicating the name of the wastewater consultants they expect to employ for their pre-treatment system review.

Call me at (513) 461-4670 if you have questions or if I can be of assistance.

Sincerely,

Gary M. Bramble

Gary M. Bramble, P.E.
Industrial Wastewater Group

GMB/sjg

cc: Steve Severyn, OEPA
cc: Ken Harsh, OEPA
cc: City of Troy - Marlen E. Reber

TABLE 1

ANALYTICAL RESULTS

Hobart - Troy WWTP Ammonia Spill
December 24, 1976

Parameter	GMR-S.R. 41	Troy WWTP	GMR Tipp-Elizabeth Rd.	Ross Road
Temperature (°C)	0.5	6.0	0.5	0.0
pH (S.U.)	8.9	9.85	8.65	8.9
Ammonia (mg/l)	1.79	260	3.32	2.38
Nitrate	1.70	1.24	2.21	2.26
TOC (mg/l)	5.0	177	5.0	--
TKN (mg/l)	3.06	343	5.42	3.61

DISCUSSION OF ANALYTICAL RESULTS

The results from the sampling of December 24, 1976, were received by the Southwest District Office of the Ohio EPA on January 14, 1977. Table 1 shows the data of the four sampling station.

The Water Quality Standard (WQS) for ammonia is 1.5 mg/l. The three samples of the Great Miami River (GMR) all show violations of the ammonia WQS. Based on this data, it is assumed that the ammonia spill discharge had not yet reached the first sampling station (Tipp-Elizabeth Road). The ammonia levels present probably indicate the effect the Troy WWTP normally has on the Great Miami River at the existing flow rate (20 cfs at State Route 41 - data provided by Ken Harsh). Note the high ammonia level of the Troy WWTP.

Table 2 reveals data for the GMR on December 28, 1976 (sample results received January 20, 1977). At all stations, the ammonia WQS was violated. A peak concentration of 14.6 mg/l was measured at Rip Rap Road. The decrease in dissolved oxygen and the increase in BOD_5 should be noted. Water quality degradation is quite evident.

TABLE 2

ANALYTICAL RESULTS

Hobart - Troy WWTP Ammonia Spill
December 28, 1976

Parameter	GMR S.R. 41	Troy WWTP	GMR Tipp-Elizabeth Rd.	GMR-Ross Rd.	GMR Rip-Rap Rd.
Temperature (°C)	0.0	12.0	0.0	0.0	0.0
pH (S.U.)	8.6	8.0	8.5	8.45	8.5
Dissolved Oxygen (mg/l)	13.7	5.0	9.9	9.9	10.2
Total Solids (mg/l)	539	747	547	525	490
Suspended Solids (mg/l)	10	98	21	20	10
Ammonia (mg/l)	1.62	78.0	10.3	9.67	14.6
Nitrate (mg/l)	1.85	0.05	1.95	2.03	1.98
Phosphorus (mg/l)	1.56	9.2	3.00	2.9	1.9
BOD_5 (mg/l)	2.1	23.6	14.8	14.4	11.2
TOC (mg/l)	14	61.0	7.0	4.0	4.0
TKN (mg/l)	2.38	102.0	14.4	13.0	18.1

HOBART-TROY WWTP

AMMONIA SPILL

December 24, 1976

0800 hours - Received call from Mr. Marlen Reber, Troy Safety Service Director. He informed me of ammonia odors at the north pump station. He asked if I would investigate the situation. He was reasonably certain that Hobart Company was the source.

0820 hours - Received call from Mr. Lawrence Lewis, Troy WWTP opeator. He asked that I meet him at the north pump station.

0900 hours - Met Mr. Lewis at the pump station. Strong ammonia odor was very noticeable. For the next 40 minutes I accompanied Mr. Lewis to the Hobart facility and surrounding locales to attempt to secure a sample from the appropriate sewer line. Several manholes were lifted, but no samples were taken, as no ammonia odors were noticed. We suspected that Mr. Reber had already contacted Hobart and that the discharge had ceased.

0945 hours - Grab sample (1 quart) was taken of the raw influent to the Troy WWTP in the Parshall flume and iced. Strong ammonia odor was noticed in the WWTP aeration tanks.

0950 hours - Grab sample (1 quart) was taken of the final effluent of the Troy WWTP at the chlorine contact tank discharge and iced.

1020 hours - Grab sample (1 quart) was taken of the Great Miami River on the south side of the S.R. 41 bridge and iced.

1035 hours - Grab sample (1 quart) was taken of the Great Miami River on the south side of the Tipp-Elizabeth Road bridge and iced. No dead fish were observed.

1050 hours - Grab sample (1 quart) was taken of the Great Miami River on the north side of the Ross Road bridge and iced. No dead fish were observed.

All samples were then taken to the SWDO-OEPA warehouse and measured for temperature and pH. Subsequent to that, each sample was preserved with 1.5 ml of sulfuric acid (H_2SO_4) and placed in a refrigerator. These samples were then turned over to Mr. Ken Harsh on December 7, 1976, for transport to the Ohio Department of Health (ODH) Laboratory in Columbus.

December 28, 1976

Grab samples were taken (1 gallons and 1 quart) at several sites along the Great Miami River as a follow-up to happenings on the 24th. Samples were taken at the following sites:

Great Miami River - S.R. 41 - 0815 hours
Troy WWTP - Chlorine contact tank - 0830 hours
Great Miami River - Tipp-Elizabeth Road - 0915 hours
Great Miami River - Ross Road - 0935 hours
Great Miami River - Rip Rap Road (north side of bridge) - 0955 hours.

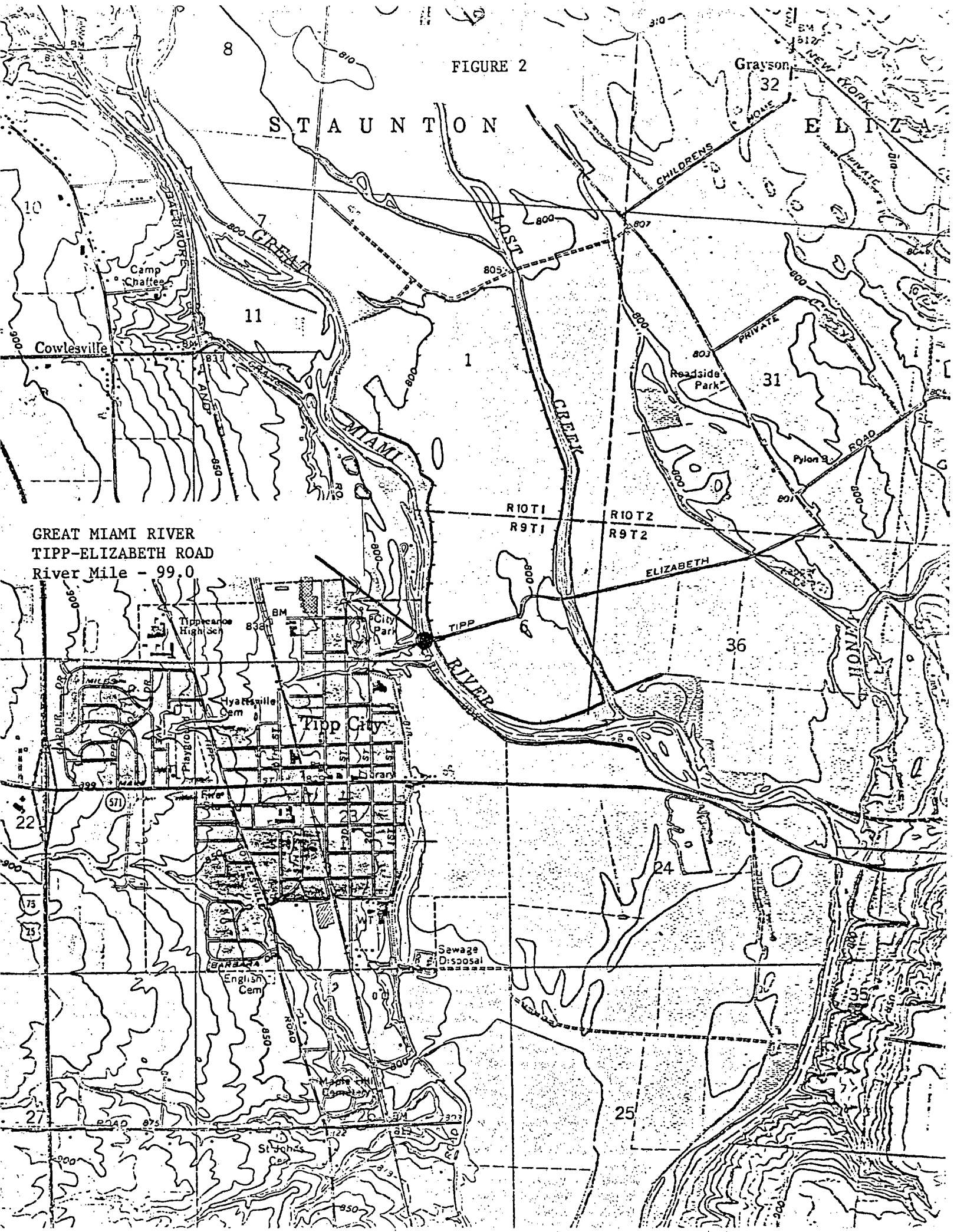
Field tests were run for temperature, pH, and dissolved oxygen at each site. All quart samples were preserved with 1.5 ml of H_2SO_4 and iced (as were the gallons). Samples were taken to the SWDO-OEPA warehouse, refrigerated, and turned over the Ms. Betty Huffman for transport to ODH in Columbus.

Several dead fish (carp and suckers) were observed at Tipp-Elizabeth Rd. Figures 1, 2, 3, and 4 are copies of USGS topographic maps indicating the sample sites and appropriate river mile location

FIGURE 1

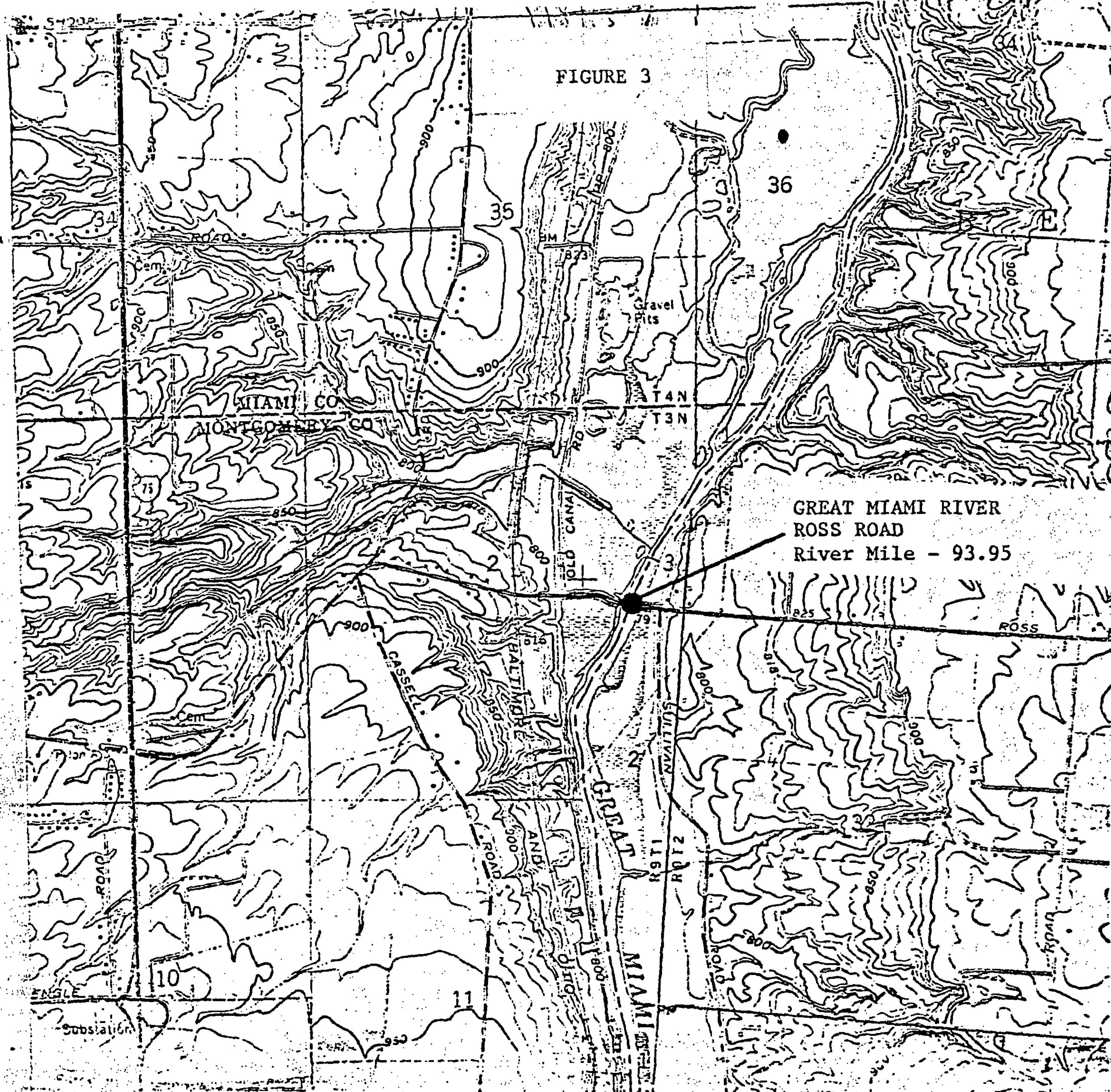

GREAT MIAMI RIVER - STATE ROUTE 41
River Mile - 104.1 (S.R.)
TROY WWTP
Final Effluent
River Mile - 103.65
County Fairground
RIVERSIDE CEMETERY
Treasure Island Park
High Sch
Hobart Arena
Memorial Stadium
Community Center
Edwards Sch
Courthouse
Heywood Sch
TROY
Rose Hill Cem
Stouder Memorial Hospital
Kyle Sch
Van Cleve Sch
Forest Sch
Golf Course
Sewage Disposal
Water
PENN CENTRAL
Country Club
Thomas Cem
SWAILES
Island No 3
RIVER
MIAMI
GREAT
Sherwood

FIGURE 2



GREAT MIAMI RIVER
TIPP-ELIZABETH ROAD
River Mile - 99.0

FIGURE 3


GREAT MIAMI RIVER
ROSS ROAD
River Mile - 93.95
MIAMI CO
MONTGOMERY CO
T4N
T3N
Gravel Pits
OLD CANAL RD
BALTIMORE
CASSEL ROAD
GREAT MIAMI
SULLIVAN ROAD
ROSS
Substation
ENGLE
Cem
35
36
2
3
10
11

DAYTON NORTH Q
OHIO—MONTGOM
7.5 MINUTE SERIES (